

Mapping Earth's Surface ▪ *Laboratory Investigation***Using a Topographic Map****Pre-Lab Discussion**

When was the last time you used a map? Perhaps you used a road map to help plan a trip. You may have looked at a world map to locate a country for a school assignment. Did you ever use a map mounted in a mall to find a certain store? Maps provide a variety of information. They can show not only where something is but what it looks like. That's what topographic maps do. They show the shape of the land by providing a three-dimensional view of Earth's surface. With a little practice, you can read a topographic map and picture the landscape as if you were flying over it in a plane.

Imagine that your class is completing a three-day outdoor education program. You've learned about the plants and animals that live near your town of Mountain View. You've learned about the landforms in the area and how to read them on a topographic map. As a final exercise, the program leader has arranged a treasure hunt. She will fly a plane over the area and drop a bright red canister attached to a bright red parachute. Inside the canister are all kinds of gift certificates for the class. In this investigation, you will use clues and interpret a topographic map to find the canister. To do so, you need to know that each degree of latitude and longitude is divided into units called minutes. One degree is 60 minutes. The number of minutes for a given latitude is listed right after the number of degrees. The symbol for minutes is an apostrophe. The map in Observations shows examples of latitude and longitude using minutes.

1. Explain what a contour line is.

2. What kind of information do contour lines provide?

3. How would you write the latitude of a point that is half way between 35° N and 36° N? Use degrees and minutes.

Problem

How can you use a topographic map to pinpoint a location?

Materials (*per group*)

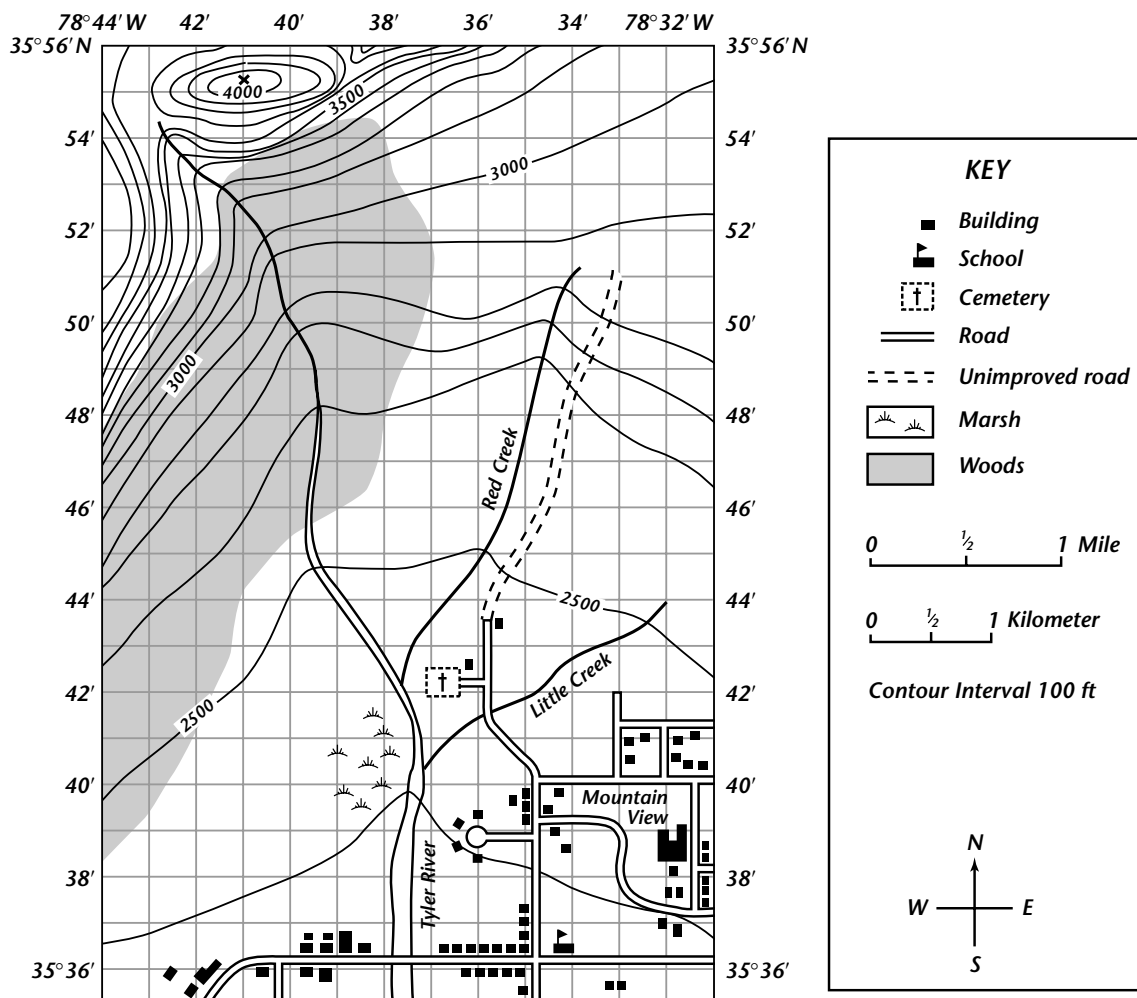
metric ruler

pencil

Mapping Earth's Surface ▪ *Laboratory Investigation***Procedure**

The Program Leader has sent the following radio message from her plane:
 "Attention outdoor ed. students . . . heading northwest . . . over crossroads
 and school . . . marsh on my left . . . following river . . . over woods now . . .
 cliff approaching . . . turning northeast . . . crossing river . . . winds are
 calm . . . treetops . . . CANISTER AWAY!"

1. Use the message and the topographic map in Observations to determine where the pilot started sending the message.
2. Trace on the map the probable path taken by the pilot.
3. On the map, shade in an area where you would concentrate your search for the canister.

Observations

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Using a Topographic Map *(continued)*

Analyze and Conclude

1. What are the latitude and longitude of the highest elevation on the map?

2. In which direction does the Tyler River flow? How do you know?

3. What clues in the pilot's radio message tell you where to start looking for the canister? What other clues might the pilot have given?

4. What are the latitude and longitude of the most likely place to find the canister? Give a reason for your answer.

5. How far will you have to travel to reach the drop site? Assume that you will travel in a straight line.

Critical Thinking and Applications

1. Look at the area where the canister probably came down. What problems might you have retrieving the canister?

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2. Your class has decided to divide into teams to see which team can find the canister first. What suggestions would you make to your team for getting to the site quickly? Give reasons for your suggestions.

3. Suppose a steady wind is blowing from the west at 18 km/hr. How might this affect your search for the canister?

More to Explore

In the space below, draw a topographic map of a small island. Use the following description. Show direction on the map and state the contour interval.

- The highest point of the island is 172 feet. The island is steeper on the east side than it is on the west side.
- A stream flows from the center of the island northwest to the coast.
- A marsh exists at the shoreline of the west side of the island.